

Polymeric product produced with a catalyst comprising an ion pair

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Abstract

A catalyst having high activity independent of the hydrogen concentration and low gel productivity in the polymerization of ethylene has been prepared. The preparation comprises the steps of reacting: a support comprising a magnesium halide compound having the formula (1): RO_2-nMgX_n wherein R is a C1-C20 alkyl, a C7-C26 aralkyl, a C1-C20 alkoxy or a C7-C26 aralkoxy, each same or different X is a halogen, and n is an integer 1 or 2, an alkyl metal halide compound having the formula (2): $R_{<1>}\text{M}_{m<1>}X_{n<1>}$ wherein M is B or Al, each same or different $R_{<1>}$ is a C1-C10 alkyl, each same or different $X_{<1>}$ is a halogen, $m_{<1>}$ is 1 or 2, $n_{<1>}$ is 1 or 2 when $m_{<1>}$ is 1 and $n_{<1>}$ is an integer from 1 to 5 when $m_{<1>}$ is 2, a magnesium composition containing magnesium bonded to a hydrocarbyl and magnesium bonded to a hydrocarbyl oxide, said magnesium composition having the empirical formula (3): $R_{<2>}\text{O}_{2-n<2>}\text{Mg}$ wherein each same or different $R_{<2>}$ is a C1-C20 alkyl, each same or different $R_{<3>}$ is a C1-C20 alkyl, $n_{<2>}$ is between 0.01 and 1.99, and a titanium halide compound having the formula (4): $(R_{<4>}\text{O})_{n<3>}\text{TiX}_{<2>}$ wherein each same or different $R_{<4>}$ is a C1-C20 alkyl, each same or different $X_{<2>}$ is a halogen, $n_{<3>}$ is 0 or an integer 1-3, and Ti is quadrivalent titanium.

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